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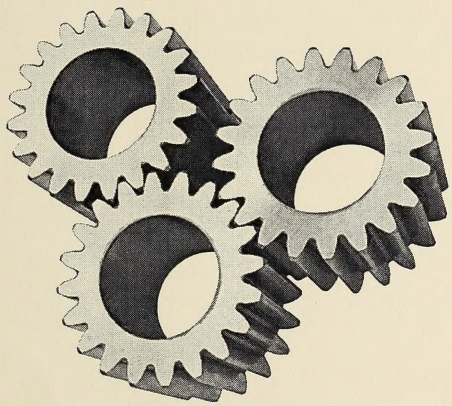
Mathematics

Module 4

Super Shapes

Home Instructor's Guide: Days 10–18
and
Assignment Booklet 4B



Learning Technologies Branch

Alberta LEARNING

Grade Two Mathematics
Module 4: Super Shapes
Home Instructor's Guide: Days 10–18 and Assignment Booklet 4B
Learning Technologies Branch
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Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
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Other	

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Daily Summary

Day 10

The student relates 3-D solids to objects in the environment.

Take the student on a "geometry walk" in the neighbourhood. It can be around the block, in a park or playground, or any natural surroundings nearby. If convenient, take the student to a grocery store as well. Identify, name, and describe all the 3-D objects you and the student see. List them all on a pad of paper.

When you and the student return from the walk, have the student write down the names of the objects you saw on your walk and write the name of the corresponding 3-D solid shape beside it. This will reinforce the objects seen as 3-D solids.

Some everyday shapes include the following:

- rolled-up sleeping bag
- aquarium
- marble
- drum
- half-open umbrella
- pot
- candle
- playpen
- sun
- suitcase
- globe
- log
- bead
- jar
- filled balloon
- chalk
- funnel
- bed
- box
- pencil tip
- unsharpened pencil
- cake
- book
- building
- brick

Day 11

This day continues from Day 10. The student makes the connection between 3-D shapes and everyday objects.

Day 11: Lesson 2

Answers

1. sphere
2. cube
3. cylinder
4. cube
5. pyramid
6. sphere
7. pyramid
8. cone
9. cylinder

There are extension activities for Days 8 to 11.

Day 11: Lesson 4

To play the Spin Game with the student remove the spinner and the game board from the Appendix. Put a paper clip on the large dot on the spinner and spin it around a pencil point. Have the student name the shape and then place a marker on one shape on the gameboard. Have the student say what the solid is and write the name under it. Keep doing this until all the solids are covered.

Have the student do the assignment for Day 11 after completing the day's lessons.

Day 12

The student learns about the different attributes of each 3-D solid.

Day 12: Lesson 1

The student learns about vertices. Assist the student with tallying the number of vertices on each solid. Neither the sphere nor the cylinder has vertices.

Answers

1. a. 8 b. 8

2. a. 5 b. 5

3. a. 1 b. 1

4. a. no b. It has no corners.

5. a. no b. It has no corners.

6. A vertex is a corner.

7. Vertices are corners.

8. a. 8
   b. 1
   c. 0
   d. 5
   e. 0

Day 12: Lesson 2

The student learns about edges. An edge is the line segment or curve where two surfaces meet. Cut small pieces of masking tape to mark the edges if the crayon doesn't work well. Assist the student with tallying the number of edges on each solid.

Answers

1. a. 12
   b. 12
   c. 8
   d. straight

2. a. 8
   b. 8
   c. 5
   d. straight

3. a. 1
   b. 1
   c. 1
   d. curved

4. a. 2
   b. 2
   c. 0
   d. curved

5. a. no
   b. It is round and has no faces.
   c. An edge is where two faces meet.

6. a. 12
   b. 8
   c. 1
   d. 2
   e. 0

7.

Shape	Edges	Vertices
cube	12	8
pyramid	8	5
cone	1	1
cylinder	2	0
sphere	0	0

Day 12: Lesson 3

The student reviews faces. Have the student mark each face with a crayon, chalk, or masking tape. Assist the student with tallying the number of vertices on each solid.

Answers

1. a. 6 c. 12
   b. 6 d. 8

2. a. 5 c. 8
   b. 5 d. 5

3. a. 1 c. 1
   b. 1 d. 1

4. a. 2 c. 2
   b. 2 d. 0

5. a. no
   b. A sphere has no flat surfaces.
   c. A face is a flat surface of a solid shape.

6. a. 6 b. 5
   c. 1 d. 2
   e. 0

7.

Shape	Faces	Edges	Vertices
cube	6	12	8
pyramid	5	8	5
cone	1	1	1
cylinder	2	2	0
sphere	0	0	0

8. a. cube
   b. cone – A cone has one face or the student might select the sphere, which has 0 faces.
   c. cube, pyramid
   d. cube, pyramid
   e. sphere
   f. cone – The sphere also has 0.
   g. cube
   h. sphere, cylinder
   i. cone – They may select the sphere with 0 edges.
   j. cube
   k. sphere
   l. cone, pyramid
   m. pyramid

There are extension activities for Days 12 to 14.

Have the student do the assignment for Day 12 after completing the day's lesson.

Day 13

The student will experiment with the shapes to see which ones roll, slide, and stack.

Day 13: Lesson 1

As the student rolls each solid, discuss why it rolls. This will help the student to identify a common attribute such as curved surfaces.

Answers

1. The cylinder, cone, and sphere roll. The cube and pyramid do not roll.
2. The cylinder, cone, and sphere roll.
3. They roll because they have curved faces and edges or are round.

Day 13: Lesson 2

As in Lesson 1, discuss why each solid can or cannot slide.

Answers

1. All the solids except the sphere slide.
2. All the solids except the sphere slide.
3. They have flat faces.
4. sphere
5. It doesn't have a flat face.

Day 13: Lesson 3

Discuss how some solids can roll and slide. The cylinder and cone can do both as they have both curved edges and flat surfaces.

Answers

1. The sphere only rolls. The cube and pyramid only slide. The cone and cylinder roll and slide.
2. The cone and cylinder roll and slide.
3. They have flat faces and curved edges.

Day 13: Lesson 4

Discuss which solids can be stacked. At least one surface must be flat to make it stack.

Have the student answer the riddles and then make up three riddles. These can be done orally or they can be written down on a separate piece of paper. Try to guess which solid shape the student is referring to.

Answers

1. All the solids except the sphere stack.
2. All the solids except the sphere stack.
3. They have flat faces.

4. a. sphere
   b. cone
   c. cylinder
   d. cube

5. a. The cylinder, sphere, and cone roll.
   b. All of them except the sphere can be stacked.
   c. All of them except the sphere slide.
   d. The sphere was marked once.
   e. The cube, pyramid, cone, and cylinder were marked twice.
   f. The cone and cylinder were marked all three times.

Day 14

The student practises sorting 3-D solids into sets.

Day 14: Lesson 1

The student will sort the geometric solids. To start the lesson, sort the solids on two different mats or pieces of cloth. On one cloth, place all the solids that roll (cone, cylinder, sphere). On the other one, place all the solids that do not roll. Ask the student to verbalize the sorting rule (rolls and doesn't roll).

Take the shapes off the mats and place all the solids that have a square face (cube, pyramid) on one mat, and the solids that don't have square faces on the other. Ask for the sorting rule.

If the student comes up with a sorting rule that is not the original idea but is correct, accept it; but, say there is another rule that applies as well. Tell the student the rule.

Answers

1. The sorting rule is solids that roll and don't roll.

2. The sorting rule is solids with square faces and no square faces.

3. a. The sorting rule is rolls and stacks and stacks only.
   b. The sorting rule is has vertices and has no vertices.
   c. The sorting rule is have round faces and have square faces.

Day 14: Lesson 2

On a large piece of paper, draw two overlapping circles or ovals. Have the student come up with two sorting rules, using the geometric solids, that form three sets. Have the student place the appropriate solids on the circles you drew.

The answer to the sorting rule is as follows: putting solids into sets so that solids with square faces are put into set one, solids with triangular faces are put into set two, and solids with both square and triangular faces are in set three.

If time remains in the math class, have the student work on an extension activity.

Answers

Some solids only roll, some slide and roll, and some others only slide.

Day 15

During today's class, the student will be building skeletons of straight-edged 3-D solids. Models of the cone, cylinder, and sphere will be made on Day16. Skeletons, or models, can be made from toothpicks, coffee stir sticks, bamboo skewers (with the sharp ends cut off), or other "sticks" that can be connected with marshmallows or balls of clay or play dough.

Day 15: Lesson 1

Place the sticks and balls of clay (or marshmallows) on the student's desk. Ensure there are enough so that all the solids can be built. You will need at least 15 balls of clay and 25 sticks.

Discuss what a skeleton is.

Day 15: Lesson 2

Look at the solid the student chose. Discuss how he or she will make it and what material will be required. Discuss the similarity and difference between the solids and the skeletal models. The models do not have faces, but they have edges and vertices like the solids.

Day 15: Lesson 3

The student will be making skeletal models of the cube and pyramid solids. Ensure the student sees the connection between the number of sticks and marshmallows to the edges and vertices of the solids.

There are extension activities for Days 15 to 18.

Have the student do the assignment for Day 15 after completing the day's lessons.

Day 16

The student will be making skeletal models of the remaining solids: the cone, cylinder, and sphere.

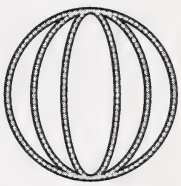
Day 16: Lesson 1

Discuss what material can be used to make a circular face. Pipe cleaners can bend to form circles and curved edges.

Day 16: Lesson 2

Give the student at least 15 pipe cleaners.

Discuss with the student how to make a sphere with pipe cleaners. The student can join two pipe cleaners together to make a circle. This will make a larger sphere, which will be easier to work with. Have the student make several circles of the same size and fit them inside each other to form the sphere.



For the cylinder, have the student use pipe cleaners to join the two faces. For the cone, have the student use pipe cleaners to join the face to the vertex.

Day 16: Lesson 3

Answers

1. The skeletons have the same number of edges (except for the sphere) and look similar to the solids.

2. The skeletons do not have faces.

Day 16: Lesson 4

Answers

1. The sphere, cone, and cylinder were more difficult.
2. no
3. They do not have straight edges.
4. The cone, cylinder, and sphere were made with pipe cleaners.

Have the student do the assignment for Day 16 after completing the day's lessons.

Day 17

The student will be making solid shapes out of modeling clay or playdough.

Day 17: Lesson 1

Give the student a plastic knife or ruler to create straight edges and corners. Demonstrate how to use the knife or ruler.

Day 17: Lesson 2

Have the student make models for all five 3-D shapes. The student will then fill in the chart for each model.

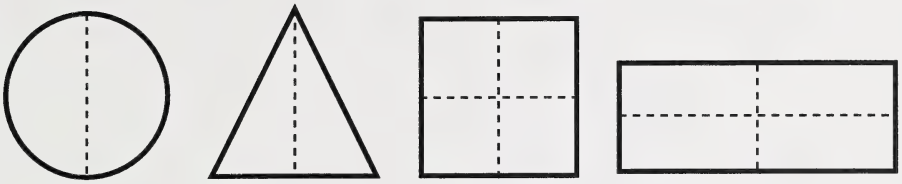
After the student has filled in the chart try this fun activity. Have the student make cuts in all the models. Each cut makes a different shape. The student may enjoy discovering the different shapes created with each cut.

Day 18

This is a review of the module.

Answers

1. a. 3 b. 3
2. a. 4 b. 4
3. a. 4 b. 4
4. a. 0 b. 0
5. a. 5 b. 5
6. a. 6 b. 6
7. The student can choose any pattern, as long as it has the three shapes and is different from the pattern shown.

8. 

9. a. sphere
   b. cylinder
   c. cube
   d. pyramid
   e. cone

10. a. 6 b. 12 c. 8

11. a. 0 b. 0 c. 0

12. a. 1 b. 1 c. 1

13. a. 2 b. 2 c. 0

14. a. 5 b. 8 c. 5

15. a. 8 b. 5

16. a. 12 b. 8

17. They both have the same number of edges and vertices.

18. The skeletal model does not have any faces.

19. The cylinder does not have straight edges.

If the student has not done some of the extension activities for Days 8–18, have the student do some now.

When the student finishes the activities for Day 18, direct him or her to the Student Survey and Student Checklist in the Assignment Booklet. The student may work on these alone or with your help. Go over the responses and discuss them with the student. Give additional instruction as needed to any of the concepts the student has indicated he or she needs help with.

Ensure that you complete the Home Instructor's Evaluation Checklist and Home Instructor's Feedback forms for Days 10 to 18. The Home Instructor's Feedback is to give any information you think may be helpful for the teacher to know.

Submit Assignment Booklet 4B for marking.

ASSIGNMENT BOOKLET 4B

Grade Two Mathematics
Module 4: Days 10–18

Home Instructor's Comments and Questions

_____
Home Instructor's Signature

FOR SCHOOL USE ONLY

Assigned Teacher:

_____

Grading

Mathematics:

_____

Neatness:

_____

Date Assignment Booklet Received:

_____

FOR HOME INSTRUCTOR USE
(if label is missing or incorrect)

Student File Number:

_____

Grading Scale

A – Very Satisfactory
B – Satisfactory
C – Needs Attention
D – Unsatisfactory

Apply Module Label Here

Name
Address
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Please verify that preprinted label is for correct course and module.

Teacher's Comments

_____
Teacher's Signature

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- Has your work been reread to be sure the spelling and details are correct?
- Is the record form filled out and the correct module label attached?

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Grade Two Mathematics

Module 4

Super Shapes

Assignment Booklet 4B

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Print the name of the 3-D solid to answer each question.

1. This solid has all square faces. _____

2. This solid has no faces. _____

3. This solid is shaped like a pop can. _____

4. This solid has only one face. _____

5. This solid has one square face. _____

6. This solid has four triangular faces. _____

First, name the shape. Then print the number of faces, edges, and vertices each has.

1. a. _____

   b. faces ☐

   c. edges ☐

   d. vertices ☐

2. a. _____

   b. faces ☐

   c. edges ☐

   d. vertices ☐

3. a. _____

b. faces ☐

c. edges ☐

d. vertices ☐

4. a. _____

b. faces ☐

c. edges ☐

d. vertices ☐

5. a. _____

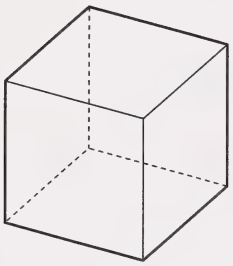
b. faces ☐

c. edges ☐

d. vertices ☐

How many sticks and marshmallows would you need to make these skeletal models?

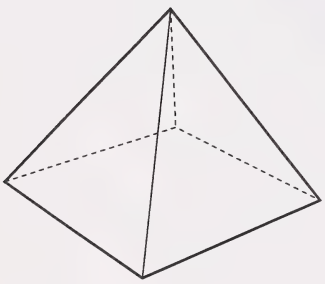
1.



a. ☐ sticks

b. ☐ marshmallows

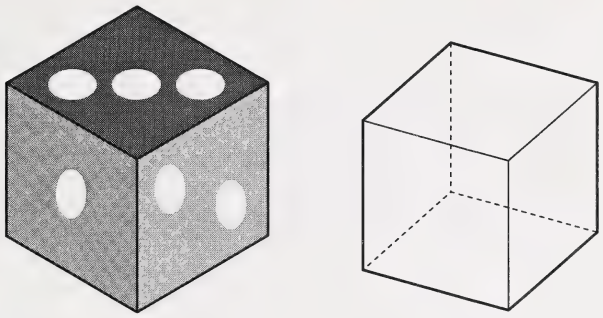
2.



a. ☐ sticks

b. ☐ marshmallows

1. How are the solid object and the skeletal model the same?



2. How are the solid object and the skeletal model different?

3. Why can't you use sticks and marshmallows to make a cone?

Student Survey

Days 10 to 18

Think about what you have learned in Days 10 to 18. Then answer these questions.

What did you like best about 2-D shapes and 3-D objects?

List **three** things you learned about shapes and solids in Days 10 to 18.

Is there something you would like to know more about?

Is there something you still need help with?

Student Checklist

Days 10 to 18

I know how to . . .	Put a check mark beside the things you can do.
1. describe faces, corners, and edges of 3-D objects	
2. name and describe 3-D objects	
3. build a skeleton of a 3-D object and tell how the skeleton is like an object	

Home Instructor's Evaluation Checklist

Days 10 to 18

Specific Outcomes/ Concepts Learned The student . . .	Has the student mastered the concept (yes or no)?
1. describes faces, vertices, and edges of 3-D objects	
2. identifies, names, and describes specific 3-D objects	
3. builds a skeleton of a 3-D object and describes how the skeleton relates to the object	

Home Instructor's Feedback

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